REMARKS

The Official Action mailed March 25, 2008 has been carefully considered. Claims 6, 7 and 11-16 are pending in the present application. Claims 6, 7 and 11-16 stand rejected. Claims 6 and 11 have been amended. Reconsideration and allowance of the subject application, as amended, are respectfully requested.

Claim Amendments

Claims 6 and 11 have been amended to recite: "wherein said (iron based) metallic coating has an ASTM C633 bond strength of at least about 12,000 psi and said bond strength is present at a coating thickness from 40 mil to 110 mil." Support for this amendment may be found in paragraph [0020] of the published application, which recites in part: "there is only very limited decreases in bond strength on increasing coating thickness from 40 mil to 110 mil in thickness." No new matter has been added by this amendment.

Rejections Under 35 USC §103(a)

Claims 6-7 and 11-16 stand rejected under 35 USC §103(a) as being unpatentable over Dorfman, U.S. Patent No. 4,822,415, and in further view of Branagan et al., U.S. Patent No. 6,125,912.

As an initial matter, claims 6 and 11 are now amended as described above and recite wherein said (iron based) metallic coating has an ASTM C633 bond strength of at least about 12,000 psi and said bond strength is present at a coating thickness from 40 mil to 110 mil.

Dorfman in view of Branagan fail to render obvious the presently claimed invention as the bond strengths developed using HVOF were not predictable from the disclosure in the references and unexpected results are produced by the claimed process.

More specifically, the *Office Action* cites to Dorfman as teaching "thermal spraying processing using an iron based alloy powder to produce a protective coating (Abst., col. 1, lines 6-9)." *Office Action* of March 25, 2008, page 3. However, it is recognized that "Dorfman does not teach that the thermal spraying process is a process of metallic coating by the claimed high velocity oxy-fuel spraying technique." *Office Action* page 4.

The Office Action then turns to Branagan's '912 recitation that "iron based alloys are especially useful for spray coating processes such as high-energy plasma, low pressure plasma spraying, high velocity oxy-fuel and other spray forming processes (col. 3 lines 1-10)" to support the proposition that "one of ordinary skill in the art would have found it obvious to have substituted the plasma thermal spraying technique in Dorfman with the high velocity oxy-fuel spraying technique with expected success since Branagan teaches that plasma spraying and high velocity oxy-fuel [are] functional equivalent [to] thermal spraying process[es] suitable for producing a iron based metallic coating." *Office Action*, page 4. In addition, "the examiner takes the position that the claimed ASTM C633 bond strength is an inherent property of the metallic coating layer. Since Dorfman in view of Branagan teach a coating process is substantially the same as the claimed coating process, using an iron based alloy that is substantially the same as the claimed iron based coating alloy, the coating layer formed by the process of Dorfman in view of Branagan would also have an ASTM C633 bond strength that is substantially the same as claimed at least about 12,000 psi." *Office Action*, page 5.

However, it is now submitted that Dorfman in view of Branagan do not predict an ASTM C633 bond strength of at least about 12,000 psi when the coating is present at a thickness from 40 mil to 110 mil. See again, amended claims 6 and 11. More specifically, Dorfman in view of Branagan do not recognize or render obvious that significantly greater bond strength would have been obtained utilizing HVOF spray techniques versus other thermal spray techniques, such as Wire Arc Spray techniques. In addition, Dorfman in view of Branagan do not recognize or render obvious that in utilizing HVOF spray techniques the claimed bond strength would be present in coating thicknesses from 40 mil to 110 mil and remain relatively stable over a number of substrates. Nor do Dorfman in view of Branagan discuss or allude to the criticality of maintaining the bond strengths over the now claimed range of coating thickness or present evidence that the bond strengths would remain relatively stable over a number of substrates.

In particular, the significance of maintaining the bond strength over a thickness from 40 mil to 110 mil is explained in paragraph [0021] of the present application, which recites in part the following.

> "The collected values of bond strength are remarkable for several reasons. First ASTM C633 standard requires that the coating be a minimum of 0.015 inches (15 mils) in thickness and most tests are carried out on coatings sprayed to thicknesses that are very close to this minimum because as the coating becomes thicker the chance of developing a critical flaw in the coating leading to premature failure is greater."

Thus, from the above, it is made clear that one would understand that the bond strengths presently claimed would be significantly reduced as coating thicknesses increases. Dorfman does not teach or suggest anything regarding the importance of developing bond strengths at the now claimed range of 40 mil to 110 mil. Accordingly, when using HVOF spray techniques the bond strengths are maintained at thicknesses well above those recited in ASTM C633.

In fact, Dorfman only provides a very general comment that the coatings "up to 1.3 mm thick were produced that were about 60% amorphous according to X-ray diffraction patterns." Col. 5, line 59-61 of Dorfman. In that sense, Dorfman provides no teaching that one may provide a metallic coating on an oxidized metal surface, with the indicated bond strengths of at least about 12,000 psi (ASTM C633), where the bond strength is present at a coating thickness from 40 mil to 110 mil.

Furthermore, it is not believed that one may fairly suggest that somehow, such feature would be an inherent characteristic of Dorfman, in view of Branagan, as again, Dorfman simply instructs that coatings "up to 1.3mm" may be applied using thermal spray techniques.

In addition, as illustrated in **Table I** of the present application, the bond strength remained relatively stable over a number of substrates using HVOF spray techniques, similar results were not seen when Wire Arc Spray coating was utilized as the bond strengths varied depending upon the substrate.

Accordingly, substitution of one thermal spray process for another does not necessarily provide predictable results. Had the claimed subject matter been predictable, it would have been expected that in substituting HVOF for Wire Arc Spray the coatings would have exhibited similar bond strengths and vastly different bond strengths depending on the substrate. However, the bond strengths of the HVOF coatings were unexpectedly relatively higher than those coatings applied by Wire Arc. In addition, the claimed bond strength produced using HVOF techniques remained unexpectedly stable over the now claimed thickness, as well as over various substrates. It would have been expected that the bond strength would have decreased as the coating

thickness increased and that the bond strength would change greatly depending on the substrate as when using Wire Arc techniques. Accordingly, the suggested substitution of HVOF for other thermal spraying processes results in an unpredictable and unexpected result and therefore the now claimed subject matter is not believed rendered obvious by the combination of Dorfman in view of Branagan.

Having dealt with all the objections raised by the Examiner, it is respectfully submitted that the present application, as amended, is in condition for allowance. Thus, early allowance is earnestly solicited.

If the Examiner desires personal contact for further disposition of this case, the Examiner is invited to call the undersigned Attorney at 603.668.6560.

In the event there are any fees due, please charge them to our Deposit Account No. 50-2121.

Respectfully submitted,

By: /Steven J. Grossman, Ph.D./
Steven J. Grossman, Ph.D.
Reg. No. 35,001